

- Mittlerer Regenfall im Bassin des Nil. Pp. 573-574.  
 — Resultate der meteorologischen Beobachtungen zu Addis-Abeba in Abessinien. Pp. 574-575.  
 — C. Michie Smith über das Klima des Bergobservatoriums Kodai-kánal (2343m) in Südindien. P. 575-576.  
**H[ann], J[ulius].** Regenmessungen auf Sumatra. P. 576-577.  
 — Meteorologische Beobachtungen im Gebiete der Hudsonbai. P. 577.  
 — Meteorologische Beobachtungen an der Hudsonbai. P. 577-578.  
**Bates, D. C.** Einige Resultate der meteorologischen Beobachtungen am Observatorium zu Wellington (Neuseeland) 1864-1903. P. 578.  
**Sapper, Karl.** Meteorologische Beobachtungen, angestellt in der Republik Guatemala in den Jahren 1902 und 1903. P. 578-581.  
 — Meteorologische Beobachtungen in Paramaribo (Guiana) in den Jahren 1900, 1901, und 1902. P. 581-583.  
 — Meteorologische Beobachtungen in Britisch-Aequatorialafrika. P. 583.  
**Martin, C.** Meteorologisches aus Chile. P. 583-584.  
**Siegel, F.** Meteorologische Beobachtungen zu Curityba im Jahre 1903. P. 584.  
*Hemel en Dampkring. Amsterdam. 2 Jahrgang.*  
 Nell, A. C. De weervoorschelling met behulp van lokale waarnemingen. P. 131-135.  
 N. Chr. A. C. De telegrafische verbinding met Ijsland en de weervoorschellingen. P. 138-140.  
*Memorie della Società degli Spettroscopisti Italiani. Catania. Vol 33.*  
**Bemporad, A.** Tavole ausiliarie per esperienze sull'assorbimento atmosferico. P. 213-225.  
*Memorias de la Sociedad Científica "Antonio Alzate." Mexico. Tomo 13.*  
**Tenorio, Francisco de P.** Ligera critica acerca del abrigo "Pastraná" para termómetros. P. 371-377.

#### RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

By Mr. H. H. KIMBALL, Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them.

**Carnegie Institution of Washington.** Year book. Nos. 1, 2, 3, 1902, 1903, 1904. v. p. Washington. 1903-1905.

**Commission für Oceanographische Forschungen.** Achte Reihe. (Aus den Denkschriften der Kais. Akademie der wissenschaften in Wien. Bd. LXXIV.) 323 pp. f°. Wien. 1904.

**Egypt. Survey Department, Public Works Ministry.** Meteorological report for the year 1902. The Survey Department, Public Works Ministry, Cairo. 204 pp. 12°. Cairo. 1904.

**Finland. Institut Météorologique Central de la Société des Sciences de Finlande.** Observations météorologiques publiées par l'Institut Météorologique Central de la Société des Sciences de Finlande. Etat des glaces et des neiges en Finlande pendant l'hiver 1893-1894 exposé par Axel Heinrichs. 59 pp. f°. Helsingfors. 1904.

**Finland. Institut Météorologique Central de la Société des Sciences de Finlande.** Observations publiées par l'Institut Météorologique Central de la Société des Sciences de Finlande. Volume dixième. Observations météorologique faites à Helsingfors en 1899. 90 pp. f°. Helsingfors. 1904.

**Finland. Institut Météorologique Central de la Société des Sciences de Finlande.** Observations météorologiques publiées par l'Institut Central de la Société des Sciences de Finlande. 1891-1892. vi, (122), 122 pp. f°. Helsingfors. 1904.

**France. Association Française pour l'Avancement des Sciences.** Compte rendu de la session. Angers. [In two parts.] v. p. 8°. Paris. 1904.

**Geographisches Jahrbuch.** XXVI. Band, 1903. 496 pp. 8°. Gotha. 1903-1904.

**Gorczynski, Ladislas.** Etudes sur la marche annuelle de l'insolation. (Extrait du bulletin de l'Academie des Sciences de Cracovie. Classe des sciences mathématique et naturelles. Juillet 1903.) Pp. 466-503. 8°. Cracovie. 1903.

**Gorczynski, Ladislas.** Sur la diminution de l'intensité du rayonnement solaire en 1902 et 1903. (Comptes rendus de l'Academie des Sciences, Paris. Tome 138, No. 5.) 3 pp.

**Great Britain. Meteorological Office.** Hourly readings obtained from the self-recording instruments at four observatories under the meteorological council, 1901. Thirty-third year; new series. Volume

II. Published by authority of the Meteorological Council. xii, 197 pp. f°. London. 1904.

**Hildebrandsson, H. Hildebrand and Teisserenc de Bort, Léon.** Les bases de la météorologie dynamique historique—état de nos connaissances. 7me livraison. Pp. 243-306. 8°. Paris. 1904.

**Institut Agricole de Lausanne.** Observations météorologiques faites a la Station Météorologique du Champ-de-l'air. Institut Agricole de Lausanne. Année 1903. XVII e année. (16), 43 pp. 4°. Lausanne. 1904.

**Leyst, Ernst.** Beobachtungen angestellt im Meteorologischen Observatorium der Kaiserl. Universität Moskau im Jahre 1902. Hrsg. von Prof. Dr. Ernst Leyst. 107 pp. 8°. Mockba. 1903.

**Leyst, Ernst.** Contemporary problems in the study of atmospheric electricity. [Russian text.] 2 pp. 8°. Mockba. 1904.

**Leyst, E.** Meteorologische Beobachtungen in Moskau im Jahre 1900, 1901, 1902, 1903. v.p. 8°. n.t.p.

**Leyst, Ernst.** Die Halophänomene in Russland. (Société Impériale des Naturalistes de Moscou.) Pp. 293-428. 8°. Mockba. 1903.

**Merecki, Romuald.** Klimatologie ziemi Polskich. I. Meokresowa zmienność temperatury powietrza. 112 pp. 4°. Krakow. 1889.

**Merecki, Rom.** Die Sonnentätigkeit und die unperiodischen Luftdrückänderungen. (Meteorologische Zeitschrift, Wien, Jan., 1904. 17 pp.)

**Merecki, R.** Wpływ zmiennej działalności słońca na neokresowę ruchy atmosfery ziemskiej. (Odbitka z "Prac matematyczno fizycznych". T. XIV.) 28 pp. Warszawa. 1903.

**Observatoire de Zi-Ka-Wei.** Calendrier-annuaire pour 1905. 218 pp. 16°. Chang-Hai. 1904.

**Paffrath, Josef.** Meteorologische Beobachtungen aus dem Rheingebiete von Chur bis zum Bodensee. (XIII Jahresbericht des öffentlichen Privatgymnasiums an der Stella Matutina zu Feldkirch. 1903-1904.) 56 pp. 8°. Feldkirch. 1904.

**Prussia. Königlich Preussisches Meteorologisches Institut.** Deutsche Meteorologisches Jahrbuch für 1903. Preussen und benachbarte Staaten. Hrsg. vom Königlich Preussischen Meteorologischen Institut durch dessen Direktor Wilhelm von Bezold. Pp. 63-122. f°. Berlin. 1904.

**Prussia. Landesanstalt für Gewässerkunde.** Jahrbuch für die Gewässerkunde Norddeutschlands. Hrsg. von der Preussischen Landesanstalt für Gewässerkunde. Abflussjahrgang 1901. [In 6 parts.] v.p. f°. Berlin. 1904.

**Queensland. Water-Supply Department.** Map of Queensland showing annual rainfall to end of 1903. Water-Supply Department. 1 sheet. 30 x 22 in.

**Rethly, Anton (coll.).** Erdbebenbeobachtungen in Königreich Ungarn im Jahre 1903. Zsgst. von Anton Rethly. (Separatabdruck aus: Jahrbücher der k. ung. Reichsanstalt für Meteorologie und Erdmagnetismus. XXXI. Band. Jahrgang 1901. IV. Theil. [Hungarian and German text.] 19 pp. f°. Budapest. 1904.

**Richthofen, Ferdinand Frhr. v. (Ed.)** Deutsche Südpolar-Expedition auf dem Schiff "Gauss" unter Leitung von Erich von Drygalski. Bericht über die wissenschaftlichen Arbeiten. (Veröffentlichungen des Instituts für Meereskunde geographischen Instituts an der Universität Berlin. Hrsg. von den Direktoren Ferdinand Frhr. v. Richthofen.) Hefte 1, 2, 5. v.p. 8°. Berlin. 1902-1903.

**Rotch, A. Lawrence.** The first observations with 'ballons-sondes' in America. (Reprinted from Science, N. Y., N. S., Vol. XXI, p. 76-77.)

**Rotch, A. Lawrence.** Five ascents to the observatories of Mont Blanc. (Extract from Appalachia, Vol. X, pp. 361-373.)

**Rotch, A. Lawrence.** An instrument for determining the true direction and velocity of the wind at sea. (From Quarterly Journal of the Royal Meteorological Society, London, Vol. XXX, pp. 313-316.)

**Rotch, A. Lawrence.** Present problems of meteorology. (Reprinted from Science, N. Y., N. S., Vol. XX, pp. 872-878.)

**Rotch, A. Lawrence.** A project for the exploration of the atmosphere over the tropical oceans. [Abstract of paper read before VIII International Geographic Congress in 1902.] 1 p. 8°.

**Santesson, C. G. and others.** Les prix Nobel en 1901. v.p. 8°. Stockholm. 1904.

**Saxony. Königlich Sachsisches Meteorologisches Institut.** Dekaden-Monatsberichte des Königl. sächsischen Meteorologischen Institutes. 1903. Jahrgang VI. Hrsg. vom Direktor Professor Dr. Paul Schreiber. 100 pp. f°. Chemnitz. 1904.

**Saxony. Königlich Sächsischen Meteorologisches Institut.** Jahrbuch des Königlich sächsischen meteorologischen Institutes für das Jahr 1900. Jahrgang XVIII. (55), 167 pp. f°. Chemnitz. 1905.

**Smithsonian Institution.** Report of S. P. Langley, Secretary of the Smithsonian Institution, for the year ending June 30, 1904. 99 pp. 4°. Washington. 1904.

**Straits Settlements. Principal Civil Medical Officer.** Annual report on meteorological observations in the Straits Settlements for the year 1903, by D. K. McDowell. n.p. f°. Singapore. 1904.

#### NOTES AND

#### APPARATUS FOR INSTRUCTION IN PHYSICS AND METEOROLOGY.

The editor has so often been asked what apparatus to buy

#### EXTRACTS.

or how best to expend a given amount of money for furnishing a school laboratory, that he would venture a few general remarks on this subject.

In manual training schools, technical schools, colleges, and post graduate or university research schools, wherever the primary object is to teach and practise the greatest exactness of construction, observation, and investigation; there, of course, nothing but the best should be allowed. These schools are conducted by teachers who understand exactness; it is mostly the public grade schools or high schools that apply for advice as to apparatus for elementary educational purposes.

For high schools and lower grades, the object of whose instruction is to teach general principles and the elements of physics, expensive accurate measuring apparatus is not required. The scholar will learn general laws and principles better by making a rough instrument himself than by merely looking at a highly finished one.

When a teacher desires to maintain a daily weather record as a voluntary observer, he must be provided with the standard apparatus of the Weather Bureau. No cheaper makeshift will do. He need not buy a complete outfit, but what he has must be standard. But when such a record is kept only for local educational purposes as the beginning of a system of training for young pupils, expensive apparatus is objectionable, and the simplest (not always the cheapest) apparatus is most desirable, so that a youth may handle it and easily see how it works and what its source of error may be. For such cases the mercurial thermometer divided on its glass stem, the sling psychrometer, the wind-pressure anemometer, using a pendulous sphere or a square plate, or a Lind anemometer, a home-made siphon mercurial barometer, a Campbell sunshine recorder with a burning glass as a substitute for the expensive sphere, these among others offer the desired simplicity, while sufficient to record the atmospheric phenomena abundantly for educational purposes.

It seems very inadvisable to introduce into elementary schools expensive instruments that are used for exact scientific work or exemplify the best methods of science, such as a Green-Fortin barometer, or the Robinson whirling anemometer, whose structures are complex and whose actions and corrections depend on a theory that can not be demonstrated by simple reasoning adapted to the elementary knowledge of the pupil. Let a youth learn about the more complex and precise physical apparatus after he passes on to the college and higher technical schools. He will then come to understand the sources of error of the so-called "popular" instruments, and understand the lingo of the salesman of "school supplies" who recommends the wooden support of his barometer scale as making an absolutely constant and correct instrument, or his thermometer as equal to those of the Weather Bureau. The best part of education is to teach a man where to go for reliable information on matters that he has not himself thoroughly studied, and how to protect himself against imposition of all kinds.—C. A.

#### A RIVER AND FLOOD SERVICE ON THE GRAND RIVER OF MICHIGAN.

In view of the recent extension of the River and Flood Service of the Weather Bureau in various parts of the country, we may perhaps call attention to certain minor advantages incidental to this work, whose main purpose is the protection of lives and property threatened by high water. The careful study of the rivers by this service, and the systematic observations carried out at river stations yield information of high value in connection with questions of water power, water supply, irrigation, and other hydrographic problems, and on the larger streams are of the utmost importance in connection with navigation and the work of river improvement. Something on these points is suggested by the following statements:<sup>1</sup>

<sup>1</sup>From the December report of the Michigan Section of the Climate and Crop Service of the Weather Bureau, by C. F. Schneider, Section Director at Grand Rapids, Mich.

In view of the destructive floods along the Grand River of Michigan in March, 1904, the Chief of the Weather Bureau has inaugurated a river and flood service on that river; with the Grand Rapids Weather Bureau Office as the river center. River gages have been located at Eaton Rapids, Lansing, Grand Ledge, Portland, Ionia, and Grand Rapids, and readings will be made daily during February, March, and April, and at any other season when necessary. These stations are also equipped with rain gages, and in connection with a special rainfall station at Jackson will furnish the data regarding the height of the river and amount of precipitation.

The Weather Bureau made a careful survey of the river in order to determine the height of the river bed at the various gage stations. In all cases the zero of the gage is the same as the bed of the river, and the danger line was determined by consultation with the principal manufacturing interests. From marks preserved by various citizens the elevation of the high water of March, 1904, was also determined. Much of this data is entirely new and very interesting. The rapid fall of the river between Grand Ledge and Ionia is a feature that has never before been definitely determined, and the great possibilities of that particular section for water power are clearly shown. The drainage area of the Grand River, 5572 square miles, is the second largest in the State.

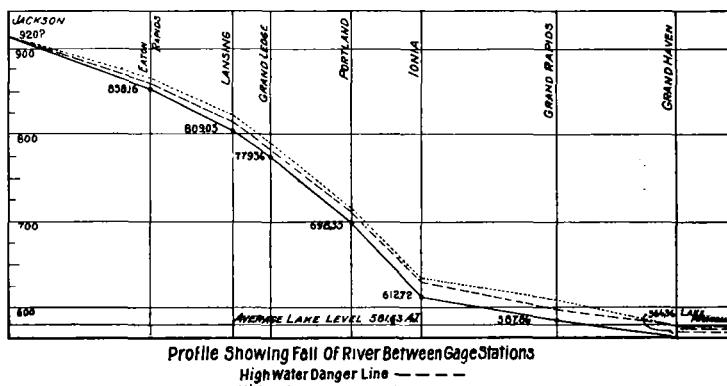


FIG. 1.

The floods of the last decade of March, to which Mr. Schneider refers, were caused by rains that melted the accumulated snow of almost the entire winter while the ground was frozen and unable to absorb any of the water thus suddenly formed. At Grand Rapids about 14,000 persons were rendered temporarily homeless, and the total damage by the flood in that city alone is estimated at \$2,000,000.—F. O. S.

#### WEATHER BUREAU MEN AS INSTRUCTORS.

Mr. William G. Burns, Section Director, Springfield, Ill., on January 25 addressed the class in physical geography from the Springfield High School, at the office of the Weather Bureau. Mr. Burns described the work of the Weather Bureau and explained the principles of forecasting, the construction of the weather map, and the use of meteorological instruments.

Mr. David Cuthbertson, Local Forecaster, Buffalo, N. Y., states that students from two of the local high schools, and also from the Lancaster, N. Y., High School, visited the office during January and received instruction in elementary meteorology, with an explanation of the instruments and work of the Weather Bureau.

Mr. G. A. Loveland, Section Director, Lincoln, Nebr., delivered two addresses before the Farmers' Institute; on January 5, at Johnson, Nebr., on "Weather Forecasts, how Made, Distributed, and Used," and on January 31, at Fairbury, Nebr., on "The Climate of Nebraska."

Mr. George T. Todd, Observer, Wichita, Kans., on January 19 addressed the preparatory class of Fairmount College. The